EPCRA Section 313 Toxic Release Inventory Reporting
Naval Air Facility El Centro
Reporting Year 2020

1.0 PURPOSE

This document summarizes the results of Toxic Release Inventory (TRI) compliance reporting for Naval Air Facility El Centro (NAFEC) for Reporting Year (RY) 2020. Annual TRI reporting is governed by regulations established under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313, as interpreted by United States (U.S.) Department of Defense (DoD) and Department of Navy (Navy) policy and guidance. This document was prepared by the NAFEC Environmental Department and Multi-Media Environmental Compliance Group (MMEC Group) under Contract Number N62470-16-D-2405, Delivery Order N6247318F4764.

2.0 LOCATION

NAFEC is in the center of southern California's Imperial Valley. It is a 2-hour drive east from San Diego and south from Palm Springs, California (CA), 1 hour west from Yuma, Arizona, and 15 minutes north from the U.S. border with Mexico. It is a remote and isolated location, with an average military onboard count of 230 people.

3.0 MISSION

The mission of NAFEC is to support the combat training and readiness of the warfighter. NAFEC's vision is to be the Navy's premier tactical training air installation.

4.0 PRIMARY ORGANIZATIONS/ACTIVITIES LOCATED AT THE FACILITY

NAFEC provides realistic training to active and reserve aviation units and activities of the Navy's operating and training forces. Squadrons visit NAFEC to practice gunnery, bombing, carrier landings, and air combat. There are no squadrons permanently stationed at NAFEC or any tenant organizations.

The primary organizations on base relevant to TRI reporting are the following:

- Airfield Operations and Aviation Support includes the following:
  - Air Traffic Control
  - Aviation Fuel Support
  - Ground Electronics
  - Airfield Facilities
  - Passenger Terminal and Cargo Handling
- The Commander, Navy Installations Command (CNIC) Facility Support Program oversees the following programs:
  - Military Construction
  - Facilities Support Services (janitorial, pest control, refuse collection, recycling, grounds maintenance, street sweeping, and snow removal)
  - Facilities Management (management and administration, installation plans and engineering, collateral equipment, and real estate)
  - Base Support, Vehicles, and Equipment

  - Utilities (electricity, potable water, compressed air, natural gas, wastewater, and solid waste disposal)
- Morale, Welfare, and Recreation (MWR) provides facilities, programs, and activities to meet recreational and social needs of NAFEC personnel and their families.

Other than "touch-and-go" landings and take-offs, aircrews use several nearby bombing ranges to develop their skills. These ranges are not geographically contiguous with the main NAFEC installation, so they must be addressed separately for TRI reporting purposes.[1]

For TRI purposes, it is important to note that there are no small arms ranges or central steam/power plants at NAFEC.

5.0 RECENT TRI REPORTING HISTORY

NAFEC submitted U.S. Environmental Protection Agency (USEPA) Form Rs for nitrate compounds for RY2012 through RY2019.

6.0 HAZARDOUS MATERIAL AND TRI CHEMICAL DATA

TRI requires submittal of a Form R for quantities of any listed toxic chemical exceeding one of the following thresholds:

- 25,000 pounds (lb) per year for chemicals manufactured onsite
- 25,000 lb per year for chemicals processed onsite
- 10,000 lb per year for chemicals otherwise used onsite
- 100 lb per year for per- and polyfluoroalkyl substances (PFAS)
- Chemical-specific thresholds for persistent bioaccumulative toxic (PBT) chemicals
  - 0.1 gram per year for dioxin and dioxin-like compounds
  - 10 lb per year for benzo[g,h,i]perylene, chlordane, heptachlor, hexachlorobenzene, isodrin, mercury, mercury compounds, octachlorostyrene, pentachlorobenzene, polychlorinated biphenyls (PCBs), and toxaphene
  - 100 lb per year for aldrin, lead, lead compounds, methyoxychlor, pendimethalin, polycyclic aromatic compounds (PACs), tetrabromobisphenyl A, and trifluralin

Section 7321 of the National Defense Authorization Act (NDAA) for fiscal year 2020 (P.L.116-92) added 172 individual PFAS chemicals to the TRI list of chemicals with an effective date of January 1, 2020. RY2020 Form R reporting is required for any of these PFAS chemicals that individually exceed the 100-lb-per-year usage quantity threshold. The NAFEC TRI threshold evaluation for these chemicals is presented in Section 6.5.

Per USEPA instruction, the TRI manufactured, processed, and otherwise-used threshold evaluations are performed independently. For example, the amount of an individual TRI chemical manufactured is not counted toward the amount processed or the amount otherwise used.

NAFEC processes only small quantities of TRI chemicals (discussed in Section 8.0) and manufactures TRI chemicals only as byproducts of wastewater treatment and fuel combustion (discussed in Section 9.0). Otherwise-used TRI chemicals at NAFEC are addressed in the remainder of Section 6.0 and summarized in Section 7.0.

[1] A separate document addressing the RY2020 TRI reporting status for the NAFEC ranges will be prepared.

6.1 HAZMIN Center

Hazardous materials for most NAFEC organizations, including the Base Operating Support (BOS) services contractor, are distributed from the Naval Supply Fleet Logistics Center (NAVSUP FLC) Hazardous Material Minimization (HAZMIN) Center at Building 530. The key NAFEC operations that do not acquire hazardous materials from the HAZMIN Center are the Fuel Farm, water and wastewater treatment plants, and the Public/Private Venture (PPV) housing contractor. TRI chemical usage for these activities is addressed in Sections 6.2, 6.3, and 6.4, respectively.

Data regarding 2020 TRI chemical quantities issued to NAFEC activities through the HAZMIN Center were obtained from the Enterprise Resource Planning (ERP) database via Charles Roiz of NAVSUP FLC. Table 1 presents these data.

Table 1. 2020 TRI Chemical Quantities from Hazardous Material Issued through the HAZMIN Center

TRI Chemical	2020 Total Chemical Issued (lb)
Antimony compounds	1
Barium compounds	3
Chlorodifluoromethane	--
Chromium compounds	--
Copper compounds	1
Diethanolamine	--
Ethylbenzene	4
Ethylene glycol	2,154
Formaldehyde	--
Glycol ethers	42
Isopropyl alcohol	--
Lead	--
Lead compounds	1
Manganese compounds	1
Methanol	3
Methyl isobutyl ketone	--
Nickel compounds	--
Phenol	--
Toluene	4
1,1,2-Trichloro-1,2,2-trifluoroethane	2
1,2,4-Trimethylbenzene	9
Xylene	11
Zinc compounds	31

lb = pound(s); TRI = toxic release inventory

ERP is a data management system implemented by NAVSUP FLC in 2012. It tracks HAZMIN Center issuance of hazardous materials to individual organizations on base. Information captured includes date of issue, number of containers issued, and total issue weight. Chemicals in each hazardous material issue are tracked using Safety Data Sheet (SDS) information maintained within ERP. Quantities of individual chemicals issued to NAFEC work centers and

shops can be determined for the calendar year with the ERP Usage Report (ZRMIM0010). When more detail is required to track a specific chemical, the ERP Transaction History Report (ZRMMD0006) can be used to identify the shops using the chemical and the specific hazardous materials that contain the chemical.

NAVSUP FLC personnel ran the ERP Usage Report for calendar year 2020 at NAFEC. MMEC Group personnel sorted and summed these data to yield individual chemical issue quantities (by Chemical Abstracts Service [CAS] number) for each chemical in the hazardous materials issued during the year. From these data, TRI chemical issues for 2020 were compiled using MMEC Group's comprehensive listing of TRI chemicals and compound categories by CAS number.

Transactions extracted from the ERP Usage Report were limited to (1) hazardous material issues from the HAZMIN Center to the work centers (referred to as "301" or "bin issues"), and (2) direct issues to the work centers that do not physically pass through the HAZMIN Center (referred to as "501 issues"). Scrapped items ("551 issues") and bin-to-bin transfers ("309 issues") were not extracted from the ERP Usage Report, because that would constitute double counting, according to NAVSUP FLC personnel.

Of the materials identified in the ERP Usage report (Table 1) as issued at NAFEC during 2020, most were janitorial or building maintenance products, which are exempt from TRI reporting.

Lead usage was not identified in the ERP data for NAFEC. Lead is present in batteries used throughout NAFEC, but these items are covered under the TRI motor vehicle maintenance exemption and/or the article exemption. No shops at NAFEC perform battery maintenance.

Ethylene glycol in arresting gear on the airfield flight lines is an important, non-exempt use of TRI chemicals that is closely monitored for TRI reporting purposes. There are four sets of arresting gear at NAFEC. Each set consists of two dampening fluid chambers located on opposite sides of the runway, an arresting wire, and two internal combustion engines to reel in the arresting wire after use. Each dampening fluid chamber holds approximately 450 gallons (gal) of an ethylene glycol and water solution, which is used to absorb the force from the arresting wire during "tail hook" landings. [2]

Change-outs of the dampening fluid in an arresting gear unit occur only every 3 to 5 years while fluid additions to top off fluid levels occur on a regular basis. Ethylene glycol used in either instance needs to be considered toward the TRI otherwise used threshold. Data for 2020 were not available but were assumed to be similar to data for 2019. According to NAFEC Air Operations personnel, there were no complete change-outs of dampening fluid from any of the four sets of arresting gear in 2019. However, 460 gal of dampening fluid were collectively added to the arresting gear units to top off fluid levels during 2019.[3] As received, the dampening fluid contains 95 percent (%) ethylene glycol by weight and has a specific gravity of 1.10 which yields the following:

- 460 gal x 1.10 x 8.34 lb/gal x 0.95 = 4,009 lb ethylene glycol

Additionally, the ERP data was reviewed and no issues of dampening fluid to the Airfield occurred in 2020. Therefore, the 4,009 lb estimate of ethylene glycol for arresting gear is added to the 2,154 pounds from the ERP data to yield a total of 6,163 lb otherwise used.

[2] *E-28 Shore-Based Emergency Arresting Gear and Related Equipment,* chapter 9, pages 9–17.

[3] Bacilio Zavala, Airfield Flight Support Services Manager, June 3, 2020, via email from Jose Gutierrez.

6.2 Fuels

Fuel at NAFEC is distributed from three primary locations: (1) Jet Mart Gas Station, (2) Public Works Gas Station, and (3) Fuel Farm. Most fuel use at the facility is covered under the TRI motor vehicle maintenance exemption or the personal use exemption. Sections 6.2.1 through 6.2.7 discuss fuel and non-exempt uses at NAFEC.

6.2.1 Jet Fuel

NAFEC uses approximately 13 million gal of the jet propellant F24 annually. The fuel is delivered to the NAFEC Fuel Farm via the Kinder and Morgan underground pipeline, stored in aboveground tanks, and distributed primarily to training aircraft.

Fuel provided to aircraft present at NAFEC for training or other NAFEC mission-oriented purposes is covered under the TRI motor vehicle maintenance exemption.[4] These aircraft (including foreign-owned aircraft training at NAFEC) are under the operational or custodial control of NAFEC while onsite.

The only use of jet fuel not covered under the TRI motor vehicle maintenance exemption is the fueling of transient aircraft (i.e., those onsite for rest or fueling only). Note that there are no jet engine test cells at NAFEC.

NAFEC is a small and remote training base with infrequent visiting aircraft. Thus, fueling of transient aircraft is limited. Based on information provided by the NAFEC Airfield Manager, transient aircraft were supplied 2,867 gal of F24 in 2019.[5] Data for 2020 were not available but were assumed to be similar to data for 2019.

The 2020 F24 supplier for NAFEC was identified through email correspondence with Jennifer Bertone, Supply Planner for the Defense Logistics Agency (DLA), Energy Americas West.,[6] According to this DLA source, most of the jet fuel supplied to NAFEC in calendar year 2020 originated from the Philips 66 refinery.

The Philips SDS addressing F24 indicates ranges of chemical constituents for a wide variety of the company's jet fuels, including F24, JP8, and Aviation Fuel. The SDS chemical composition data show only naphthalene (3.5%) and ethylbenzene (1%) at concentrations above their TRI de minimis levels, which yields the following results:[7]

- 2,867 gal x 6.672 lb F24/gal = 19,129 lb F24
- 19,129 lb F24 x 0.035 = 670 lb naphthalene
- 19,129 lb F24 x 0.01 = 191 lb ethylbenzene

6.2.2 Diesel Fuel

NAFEC uses approximately 40,000 gal of diesel fuel annually. Diesel fuel is received by truck and is stored in an aboveground tank at the Public Works Gas Station. From here, a large portion of the fuel is dispensed to government vehicles assigned to NAFEC. This portion is covered under the TRI motor vehicle maintenance exemption. Tank trucks are used to deliver the remainder of the diesel fuel to emergency generators, pumps, GSE, and heavy equipment

[4] *How to Consider Fuel Thresholds Under EPCRA Section 313*, June 2010, Page 5. This is an addendum to the *Navy's Getting Started with the Emergency Planning and Community Right-to-Know Act (EPCRA) – a Basic Guidance Document for Navy Facilities*, May 2009.

[5] Bacilio Zavala, Airfield Flight Support Services Manager, June 4, 2020, via email from Jose Gutierrez.

[6] Email dialog with Jenifer Bertone, jennifer.bertone@dla.mil, March 10, 2021.

[7] The Philips SDS lists naphthalene at < 3.5% and ethylbenzene at < 1%. The upper bound concentrations (versus a midpoint) were used to calculate the amount of each chemical present in non-exempt F24 as a conservative approach.

vehicles. Diesel fuel use in vehicles and self-propelled GSE is exempt under the TRI motor vehicle maintenance exemption. Diesel fuel use in non-self-propelled GSE is non-exempt. Also, diesel fuel use in some emergency generators and pumps may be exempt under the TRI personal use exemption, depending on the specific use.

Table 2 summarizes non-self-propelled GSE used at NAFEC in 2020. Information on the types of GSE used, power ratings, and total hours used was provided by NAFEC GSE maintenance personnel. Calculation of fuel use in these units was based on the equipment power rating and number of operating hours.

Table 2. 2020 Fuel Usage in Non-Self-Propelled GSE at NAFEC

Equipment Identification	Power Rating (BHP)	Fuel Type	General Use of Equipment	Number of Units	Total Hours Used*	Fuel Use (gal)
A/M27T-15	111	Diesel Fuel	Portable hydraulic power supply for aircraft	8	53	150
A/M32C-17	232	Diesel Fuel	Portable air conditioning unit for aircraft	4	0	0
A/M42M-2A	10	Diesel Fuel	Portable floodlight/generator set for aircraft	4	318	81
NC-10C	220	Diesel Fuel	Portable electric power plant for aircraft	4	177	995
A/M32A-108	110	Diesel Fuel	Portable electric power plant for aircraft	5	489	1,374
A/U47A-5	550	Diesel Fuel	Portable jet aircraft starter (gas turbine)	3	84	1,180
A/M24M-6	220	Diesel Fuel	Portable aircraft ground support equipment	8	1	6
A/M37M-11	10	Diesel Fuel	Portable hydraulic fluid purifier	1	0	0
A/M32M-40	9.8	Diesel Fuel	Portable aircraft engine corrosion control cart	3	14	4
Total	--	--	--	40	1,136	3,790

*Fuel use calculated by multiplying BHP by total hours used by a factor of 0. 02554.
BHP = brake horsepower; gal = gallon(s); GSE = ground support equipment

The total quantity of diesel fuel used in emergency generators and pumps in 2020 was 4,992 gal.[8] Thus, the total non-exempt diesel fuel use at NAFEC for 2020 was 8,782 gal (i.e., 4,992 + 3,790 gal).

Exxon Mobil is the source of the diesel fuel used at NAFEC. The following TRI chemicals were identified from the November 2017, Exxon Mobil SDS for No. 2 diesel fuel:

- Naphthalene at 0.1–1.0% (= 0.55% for TRI purposes)
- Ethylbenzene at 0.1–1.0% (= 0.55% for TRI purposes)

Applying these percentages to the 8,782 gal of non-exempt diesel fuel used at NAFEC in 2020 yields:

[8] Data provided by Pedro Moreno, NAFEC Air Program Manager, to MMEC Group, May 2021.

- 8,782 gal x 7.31 lb/gal x 0.0055 = 353 lb naphthalene
- 8,782 gal x 7.31 lb/gal x 0.0055 = 353 lb ethylbenzene

Please note that 7.31 lb/gal is the density of diesel fuel.

6.2.3 Gasoline

Gasoline is received from tank trucks and is stored in aboveground tanks at the Public Works Gas Station and the Navy Exchange (NEX) Jet Mart. The NEX Jet Mart is open only to NAFEC employees. TRI chemical use at this location is covered under the TRI personal use exemption, which applies to *"personal use by employees or other persons at the facility of food, drugs, cosmetics, or other personal items containing toxic chemicals, including supplies of such products within the facility such as in a facility operated cafeteria, store or infirmary."*[9] The NEX Jet Mart qualifies as a company-operated store.

Approximately 40,000 gal of gasoline are received annually at the Public Works Gas Station. As with diesel fuel distributed from this location, gasoline is provided mainly to NAFEC maintenance and facility motor vehicles and is exempt under the TRI motor vehicle maintenance exemption. However, the small portion used in arresting gear engines on the flight lines is not covered under motor vehicle maintenance exemption.

As discussed in Section 6.1, there are four sets of arresting gear at NAFEC – each with two internal combustion engines that operate on gasoline. These engines consumed 425 gal of gasoline in 2020.[10]

Exxon Mobil is the source of the gasoline used at NAFEC. The following TRI chemicals were identified from the October 22, 2019, Exxon Mobil SDS for unleaded gasoline:

- Naphthalene at <1% (= 1% for TRI purposes)
- Ethylbenzene at 1–5% (= 3% for TRI purposes)
- Benzene at <1.65% (= 1.65% for TRI purposes)
- 1,2,4-Trimethylbenzene at 1–5% (= 3% for TRI purposes)
- n-Hexane at 1–5% (= 3% for TRI purposes)
- Toluene at 5–10% (= 7.5% for TRI purposes)
- Xylene at 5–10% (= 7.5% for TRI purposes)

Applying these percentages to the 425 gal of non-exempt gasoline used at NAFEC in 2020 yields:

- 425 gal x 0.74 x 8.34 lb/gal x 0.01 = 26 lb naphthalene
- 425 gal x 0.74 x 8.34 lb/gal x 0.03 = 79 lb ethylbenzene
- 425 gal x 0.74 x 8.34 lb/gal x 0.0165 = 43 lb benzene
- 425 gal x 0.74 x 8.34 lb/gal x 0.03 = 79 lb 1,2,4-trimethylbenzene
- 425 gal x 0.74 x 8.34 lb/gal x 0.03 = 79 lb n-hexane
- 425 gal x 0.74 x 8.34 lb/gal x 0.075 = 197 lb toluene
- 425 gal x 0.74 x 8.34 lb/gal x 0.075 = 197 lb xylene

[9] 40 Code of Federal Regulations (CFR) 372.38 (c), (3) and *Getting Started with EPCRA,* US Navy, May 2009, page 32.

[10] Data provided by Pedro Moreno, NAFEC Air Program Manager, to MMEC Group, May 2021.

Please note that 0.74 is the specific gravity of gasoline.

6.2.4 Aviation Gasoline

Aviation Gas (AVGAS) is trucked onsite as needed to fuel certain aircraft during the annual NAFEC air show. Fueling of these aircraft is exempt under the TRI motor vehicle exemption because the aircraft are under the operational control of NAFEC while onsite.

6.2.5 Propane

Propane is used at a variety of locations throughout NAFEC. Many of the uses are exempt under the TRI personal use and motor vehicle maintenance exemptions, including propane sold to NAFEC personnel from the NEX Jet Mart and MWR Auto Hobby Shop, and use at the car wash.

Other uses of propane that may or may not be exempt are:

- Standby generator at the front gate (Building 234)
- Security building (Building 565-A)
- Standby generator at Hot Pit area (Building 904)
- Site 7

Approximately 228.3 gal of propane were used at NAFEC in 2020.[11] The propane is supplied by AmeriGas, and its SDS from September 2011 indicates that the fuel contains 0–5% propylene (a TRI-listed chemical) and has a specific gravity 0.504. Applying these percentages to non-exempt 2018 propane use at NAFEC yields:

- 228.3 gal x 0.504 x 8.34 lb/gal x 0.025 = 24 lb propylene

6.2.6 Natural Gas

Natural gas fuels three boilers at Buildings 227, 436, and 4016. Natural gas does not contain any TRI chemicals at concentrations above their de minimis levels and does not impact the NAFEC otherwise used chemical threshold evaluation.

6.2.7 Fuel Summary

In summary, the 2020 non-exempt TRI chemical use in fuels at NAFEC is estimated as follows:

- Naphthalene = 670 lb +353 lb + 26 lb = 1,049 lb
- Ethylbenzene = 191 lb + 353 lb + 79 lb = 623 lb
- Benzene = 43 lb
- 1,2,4-Trimethylbenzene = 79 lb
- N-Hexane = 79 lb
- Toluene = 197 lb
- Xylene = 197 lb
- Propylene = 24 lb

[11] Data provided by Pedro Moreno, NAFEC Air Program Manager, to MMEC Group, May 2021.

6.3 Hazardous Materials Used at Potable Water and Wastewater Treatment Plants

All bulk hazardous materials used in the NAFEC water and wastewater treatment plants are delivered from local suppliers without going through the HAZMIN Center. Non-bulk hazardous materials used at the plant are obtained from the HAZMIN Center. The following bulk hazardous materials were used at the potable water and wastewater treatment plants in 2020 and none contain TRI chemicals, except for sodium permanganate (a manganese compound):

- Sodium bisulfite (CAS #7631-90-5)
- Sodium hypochlorite 12% (CAS #7681-52-9)
- Aluminum sulfate (CAS #10043-01-3)
- Sodium permanganate (CAS #10101-50-5)
- Pro Pack 9890 (contains no TRI chemicals)
- Potassium iodide powder (CAS #7681-11-0)
- pH 4 buffer solutions (contains no TRI chemicals)

Approximately 200 gal of sodium permanganate solution are used at the potable water treatment plant each year. A review of the SDS for this product (CARUSOL® C liquid permanganate) indicates that it contains 39.5% to 41.0% sodium permanganate. The amount of manganese compounds that must be accounted for in the TRI threshold is calculated as follows:

- 200 gal solution x 8.34 lb/gal x 1.39 x 0.4025 = 933 lb manganese compounds

The specific gravity of this solution is 1.39 according to the SDS.

6.4 Public/Private Venture Base Housing Contractor

Base housing at NAFEC is maintained and operated under a PPV contract. The PPV contractor is responsible for providing base housing and grounds maintenance services. TRI chemical usage by the contractor is covered under the TRI structural component exemption or the routine janitorial/facility grounds maintenance exemption.

6.5 PFAS Used in Fire Suppression

For RY2020, 172 PFAS chemicals were added to the list of TRI chemicals that must be considered in the TRI threshold evaluation. PFAS chemicals have been a critical ingredient in aqueous film-forming foam (AFFF) used for fighting petroleum fires at airfields, aboard ships, and in industrial processes; however, the use of these chemicals is being phased out and restricted. AFFF is kept on hand at multiple locations, such as aircraft hangars and fire trucks, throughout NAFEC for use in emergency fire suppression. These locations are listed in Table 3.

For TRI purposes, reportable uses of AFFF at NAFEC are as follows:

- Emergency use in fire suppression
- Firefighting training activities
- Additions of AFFF to fire suppression systems

During 2020, there were no uses of AFFF for fire suppression or in firefighting training.

Table 3. AFFF Additions to NAFEC Units in 2020

Building/Location	Volume (gal)	New AFFF Brand	Replacement Volume (gal)
820/ Hangar 2	900	Ansulite AFC-3MS	900
830/ Hangar 3	900	Ansulite AFC-3MS	900
830/ Hangar 3	900	Ansulite AFC-3MS	900
840/ Hangar 4	900	Ansulite AFC-3MS	900
840/ Hangar 4	900	Ansulite AFC-3MS	900
Fire Station 41 Crash 43	210	Ansulite AFC-3MS	210
Fire Station 41 Crash 42	210	Ansulite AFC-3MS	210
Fire Station 41 Engine 41	80	Ansulite AFC-3MS	80
820/ Hangar 2	900	NA	NA
850/ Hangar 5	900	NA	NA
850/ Hangar 5	900	NA	NA
Fire Station 41	100	NA	NA
Fire Station 41	405	NA	NA

AFFF = aqueous film-forming foam; gal = gallon(s); NA = not applicable; U.S. = United States

An unknown quantity of AFFF was accidentally released at Hangar 2 in January 2020. It was reported that 300 gal of an AFFF/water mixture were released at this time. Assuming that the type of AFFF released is 3% AFFF would equate to 9 gal of AFFF concentrate dispensed during this event.[12]

Additionally, a large-scale effort to replace older AFFF products with a Military Specification (MILSPEC)-compliant AFFF in fire suppression systems has been in effect across Commander, Naval Region Southwest (CNRSW) installations, including NAFEC. As a result, multiple systems/tanks equipped with AFFF containing PFAS chemicals at concentrations above 800 parts per billion (ppb) have been replaced with the MILSPEC-compliant AFFF.[13] These fire suppression systems were drained and refilled with a MILSPEC-compliant AFFF during 2020, as presented in Table 3. The amounts of PFAS chemicals in the MILSPEC-compliant AFFF added to these systems is counted toward the TRI reporting threshold in accordance with USEPA TRI reporting guidance relevant to closed systems.

A total of 5,000 gal of MILSPEC-compliant AFFF were added to the systems listed in Table 3 at NAFEC in 2020. The SDS for Ansulite AFC-3MS does list two proprietary chemical types as components of the mixture (polyfluorinated alkyl polyamide and polyfluorinated alkyl quaternary

[12] 3% AFFF refers to the flow rate of AFFF released per gal of water. A 300-gal AFFF/water release would include equate to 9 gal of AFFF used.

[13] Data provided by Christina Graulau, NAVFAC SW Environmental Compliance Core, to MMEC Group on February 4, 2021.

amine chloride), but does not provide CAS numbers for these items to determine if they are TRI-listed PFAS chemicals.[14] However, as directed by Navy guidance on PFAS chemicals, when AFFF manufactured after 2016 is used, as was the case in 2020 at NAFEC, a concentration of 25 ppb is to be used to determine PFAS chemical use.[15] Applying this concentration to the quantity of AFFF added in 2020 and accidentally released yields:

- 5,009 gal AFFF x 3.78 liters per gallon (L/gal) x 25 micrograms per liter (µg/L) x 0.0022 lb/gram (g) ÷ 1,000,000 micrograms per gram (µg/g) = 0.0010 lb of PFAS

Without individual PFAS chemicals identified in the new AFFF added, the 25-ppb concentration is used for the collective quantity of PFAS chemicals. Given that the 100-lb-per-year TRI threshold was not exceeded for the collective quantity of PFAS chemicals, it was concluded that no individual PFAS chemical quantity exceeded the reporting threshold for RY2020.

Additionally, the SDS for Ansulite AFC-3MS lists 2-(2-butoxyethoxy)ethanol (CAS No. 112-34-5) present in the mixture at 10-30%. This chemical falls under the glycol ether TRI chemical category (N230) and its use must be considered toward the otherwise used threshold evaluation. Using the mid point of the chemical composition range, 20%, yields the following the quantity of 2-(2-butoxyethoxy)ethanol in the Ansulite AFC-3MS added to the AFFF systems in 2020;

- 5,000 gal Ansulite AFC-3MS AFFF x 1.02 x 8.34 lb/gal x 0.20 lb 2-(2-butoxyethoxy)ethanol / lb AFFF = 8,507 lb 2-(2-butoxyethoxy)ethanol

7.0 TRI THRESHOLD EVALUATION—OTHERWISE USED CHEMICALS

Table 4 summarizes the combined quantity of otherwise used TRI chemicals from the various NAFEC organizations and data sources described in the preceding section. No quantities of TRI chemicals exceeded their otherwise-used threshold quantity for RY2020.

[14] SDS for Ansulite 3% AFFF dated January 2019 lists polyfluorinated alkyl polyamide (proprietary) at 1-5% and polyfluorinated alkyl quaternary amine chloride (proprietary) at 0.1-1%.

[15] *Guidance Document for PFAS/PFOA Reporting Under the EPCRA,* December 31, 2020.

Table 4. NAFEC RY2020 TRI Otherwise-Used Chemical Threshold Evaluation Summary Table

CAS Number	Chemical	Hazardous Materials (lb)	Non-Exempt Fuels (lb)	Potable Water and Wastewater Treatment Plants (lb)	AFFF Replacement (lb)	Total (lb)
71-43-2	Benzene	--	43	--	--	43
100-41-4	Ethylbenzene	4	623	--	--	627
107-21-1	Ethylene glycol	6,163	--	--	--	6,163
N230	Glycol ethers	37	--	--	8,507	8,544
110-54-3	N-Hexane	--	79	--	--	79
7439-92-1	Lead	--	--	--	--	--
N420	Lead compounds	1	--	--	--	1
N450	Manganese compounds	1	--	933	--	934
108-10-1	Methyl isobutyl ketone	--	--	--	--	--
91-20-3	Naphthalene	--	1,049	--	--	1,049
N495	Nickel compounds	--	--	--	--	--
115-07-1	Propylene	--	24	--	--	24
7632-00-0	Sodium nitrite	--	--	--	--	--
108-88-3	Toluene	4	197	--	--	201
95-63-6	1,2,4-Trimethylbenzene	--	79	--	--	79
1330-20-7	Xylene	11	197	--	--	208

CAS = Chemical Abstracts Service; HAZMIN = Hazardous Material Minimization; lb = pound(s)

8.0 TRI THRESHOLD EVALUATION—PROCESSED CHEMICALS

A Naval Air Systems Command (NAVAIR) contractor operates a welding shop and machining shop at NAFEC Buildings 510 and 516. The contractor sometimes fabricates replacement parts for weapons assembly carts, such as brackets and plates. The parts are distributed to Navy installations throughout the southwest. Metals (stainless steel, aluminum, etc.) and welding rods used in this operation are considered processed.

Welding rod usage data for these shops indicate that very little welding is conducted (i.e., only 2 lb of welding rods were reported in calendar year 2020).[16] Given the apparent small amount of welding activity in this shop, it is highly unlikely that TRI chemicals commonly found in metals such as nickel, chromium, and manganese were processed in quantities exceeding the 25,000-lb-per-year threshold in 2020.

9.0 TRI THRESHOLD EVALUATION—MANUFACTURED CHEMICALS

NAFEC is not in the business of manufacturing chemicals; however, TRI chemicals may be manufactured as byproducts from activities onsite. Two likely scenarios for TRI chemical byproduct manufacture are nitrate compound manufacture during domestic wastewater (sewage) treatment and TRI chemical byproducts of combustion.

[16] NAF El Centro Air Emissions Inventory Report 2020.

9.1 Sewage Treatment

Nitrate compounds manufactured as chemical byproducts during biological treatment of sewage must be considered against the 25,000-lb-per-year manufacture chemical threshold.[17] NAFEC has an onsite wastewater treatment plant (WWTP) consisting of an influent diversion box, three equalization basins, a bar screen, an overflow storage pond (holding 4.0 million gal) with a synthetic liner, an oxidation ditch, and a secondary clarifier. Oxygen is supplied to the wastewater via two rotating disks in the oxidation ditch. The plant is rated to discharge up to 0.3 million gal of wastewater per day. Secondary-treated effluent is chlorinated using a sodium hypochlorite solution and dechlorinated using a sodium bisulfite solution prior to discharge to an unnamed tributary to the New River.

Using quarterly effluent sampling results for nitrates, the amount of nitrate compounds manufactured at the NAFEC WWTP in 2020 was calculated.[18] The result (presented in Table 5) was 39,041 lb of nitrate compounds manufactured (in the form of sodium nitrate), which exceeds the TRI threshold level for manufactured TRI chemicals.

9.2 Combustion Byproducts

TRI chemicals are manufactured in small quantities as byproducts when fuel is burned. Navy TRI policy excludes byproducts emitted from motor vehicle tailpipes from inclusion in TRI manufactured chemical quantities.[19] Based on calculations of combustion byproducts manufactured at other, larger Navy installations (e.g., Naval Air Station North Island), it is highly unlikely that NAFEC exceeds a TRI chemical manufacturing threshold in this manner.

[17] *Questions and Answers for EPCRA, A Companion Document to the Getting Started with EPCRA Document for Navy Facilities*, September 2002, Questions 232 and 233, p 62 and Question 173, page 49.

[18] Data Source: Sheri Fox, NAFEC Water Program Manager.

[19] *How to Consider Fuel Thresholds Under EPCRA Section 313*, June 2010, p 5. This is an addendum to the Navy's *Getting Started with the Emergency Planning and Community Right-to-Know Act (EPCRA) – A Basic Guidance Document for Navy Facilities*, May 2009.

Table 5. NAFEC Wastewater Treatment Plant Discharge Flow and Nitrate Data

Month	Monthly Flow (gal/mo)	Nitrate (as N) (mg/L)	(lb N)[a]	(lb NO_3)[b]	(lb $NaNO_3$)[c]
Jan-20	2,039,000	46	783	3,466	4,752
Feb-20	2,175,000	46	835	3,698	5,069
Mar-20	2,005,700	46	770	3,410	4,675
Apr-20	1,617,000	30	405	1,793	2,458
May-20	1,565,500	30	392	1,736	2,380
Jun-20	1,377,000	30	345	1,527	2,093
Jul-20	1,377,000	30	345	1,527	2,093
Aug-20	1,878,600	30	470	2,083	2,856
Sep-20	2,086,300	29	505	2,236	3,066
Oct-20	2,070,800	29	501	2,219	3,043
Nov-20	1,635,000	29	396	1,752	2,402
Dec-20	1,863,100	44	684	3,030	4,154
Total	21,690,000		6,430	28,477	39,041

a. lb N = concentration (mg/L) x 3.7854 L/gal x flow (gal) x 1 lb/453,590 mg

b. lb NO_3 = lb N x 62 lb NO_3/14 lb N

c. lb $NaNO_3$ = lb NO_3 x 85 lb $NaNO_3$/62 lb NO_3, (Sodium nitrate is used as the surrogate nitrate compound for the threshold evaluation, per USEPA's *Annual TRI Instruction Manual*.)

gal = gallon(s); L = liter(s); lb = pound(s); mg = milligram(s); mo = month; N = nitrogen; $NaNO_3$ = sodium nitrate; NO_3 = nitrate ion

10.0 TRI FORM R REPORTS

NAFEC is required to prepare and submit a USEPA Form R report for nitrate compounds for RY2020. This conclusion is based on the results presented in Section 9.1 and Table 4. No other quantities of TRI chemicals exceeded a reporting threshold for RY2020.

As calculated in Table 5, 28,477 lb of nitrate compounds (as the nitrate ion [NO_3]) were released to an unnamed tributary of the New River.[20] This amount is rounded to no more than 2 significant figures and is recorded as 28,000 lb in Section 5.3.1 on the Form R for nitrate compounds. Also, 12 tons of dried wastewater treatment plant sludge were transferred offsite in 2020, which yields the following offsite transfer amount of nitrate compounds:[21]

- 12 tons dried sludge x 2,000 lb/ton = 24,000 lb dried sludge for 2020
- 480 milligrams per kilogram (mg/kg) nitrates (as N) in the sludge[22]
- 24,000 lb x 480 lb/1,000,000 lb x (62 lb NO_3 / 14 lb N) = 51 lb nitrates sent to Republic Services Landfill

[20] Per USEPA TRI reporting instructions, the complete weight of the nitrate compound must be used for the threshold evaluation; however, only the weight of the nitrate portion of the compound is included in environmental release and off-site transfer estimates. Also, TRI release estimates are typically rounded to no more than two significant figures to avoid false precision.

[21] Data Source: William Kagele, NAFEC Water Program Manager May 14, 2020.

[22] El Centro Naval Air Facility Wastewater Treatment Plant 2019 Annual Monitoring Report Sludge Results, via William Kagele, NAFEC Water Program Manager on June 18, 2020.

11.0 KEY CHANGES FROM PRECEDING YEAR

The quantity of nitrate compounds released to the New River decreased from 38,000 lb in 2019 to 28,000 lb in 2020 because of a decrease in the WWTP effluent volume and nitrate concentration. Also, an increase in the quantity of WWTP sludge caused an increase in the amount of nitrate compounds sent offsite in 2020: 51 lb compared with 9.2 lb in 2019.